

Chicago Regional Greenhouse Gas Emissions Inventory

Draft Inventory Results

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Prepared for CMAP's
Environmental and Natural
Resources Working
Committee

Presented by Emily Golla and
Rich Walter, ICF

Introductions



Rich Walter
Principal in Charge

- 26 years of experience
- Team lead for the preparation of the Chicago 2010 Metropolitan Regional GHG Inventory, GHG inventories for 88 cities in Los Angeles County, and the regional GHG reduction plan for 21 cities in San Bernardino County, among numerous other GHG inventories and climate action plans.



Emily Golla
Project Manager

- 10 years of experience
- Currently leading a team in the development of a GHG inventory for the State of Hawaii, and has supported the Environmental Protection Agency (EPA), National Parks Service, and the UK Department of Energy and Climate Change in the preparation of GHG inventories.



Agenda

- **Project Overview**
- **Inventory Results**
- **Emission Projections**
- **Potential Emission Reduction Targets**
- **Questions and Answers**



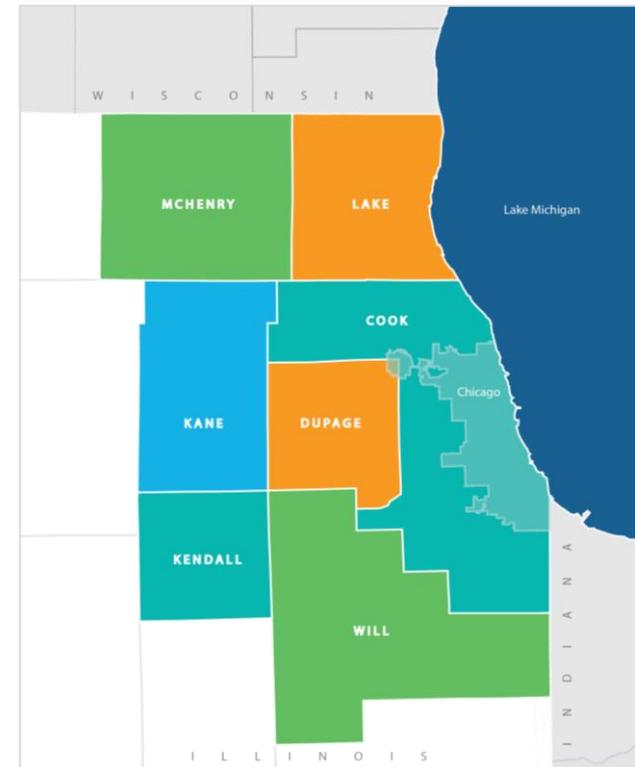
Project Overview

■ Purpose

- Develop a greenhouse gas (GHG) emissions inventory for 2015
- Update the region's 2010 inventory
- Analyze results and trends
- Develop emission projections
- Identify potential emission reduction targets

■ Scope

- Covers the seven counties of Cook (including the City of Chicago), DuPage, Kane, Kendall, Lake, McHenry, and Will



Project Overview

■ Scope (Cont.)

- Complies with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) BASIC level requirements
- Covers the Stationary Energy, Transportation, and Waste sectors

Sector	Scope 1	Scope 2	Scope 3
Stationary Energy	✓	✓	NE
Transportation	✓	✓	NE
Waste	✓	NA	✓
Industrial Processes and Product Use	NE	NA	NE
Agriculture, Forestry and Other Land Use	NE	NA	NE

✓ = Covered in this inventory; NE = Not Estimated; NA = Not Applicable

Scope 1 = emissions from sources physically located within the regional boundary

Scope 2 = emissions occurring as a result of grid-supplied electricity used within the regional boundary

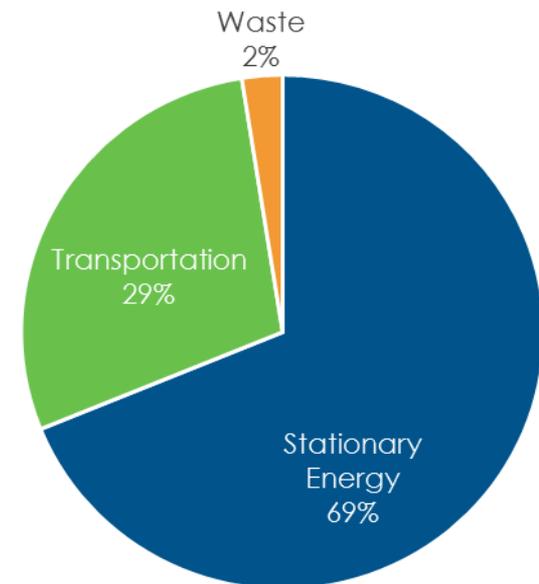
Scope 3 = emissions that occur outside of the regional boundary as a result of activities within the regional boundary

Draft Inventory Results

2015 Regional Emissions (MMTCO₂e)

Sector	Total by Scope			BASIC Total
	Scope 1	Scope 2	Scope 3	
Stationary Energy	32.29	49.61	NE	81.90
Transportation	33.72	0.35	NE	34.07
Waste	0.74	NA	2.25	2.98
Total	66.75	49.96	2.25	118.95

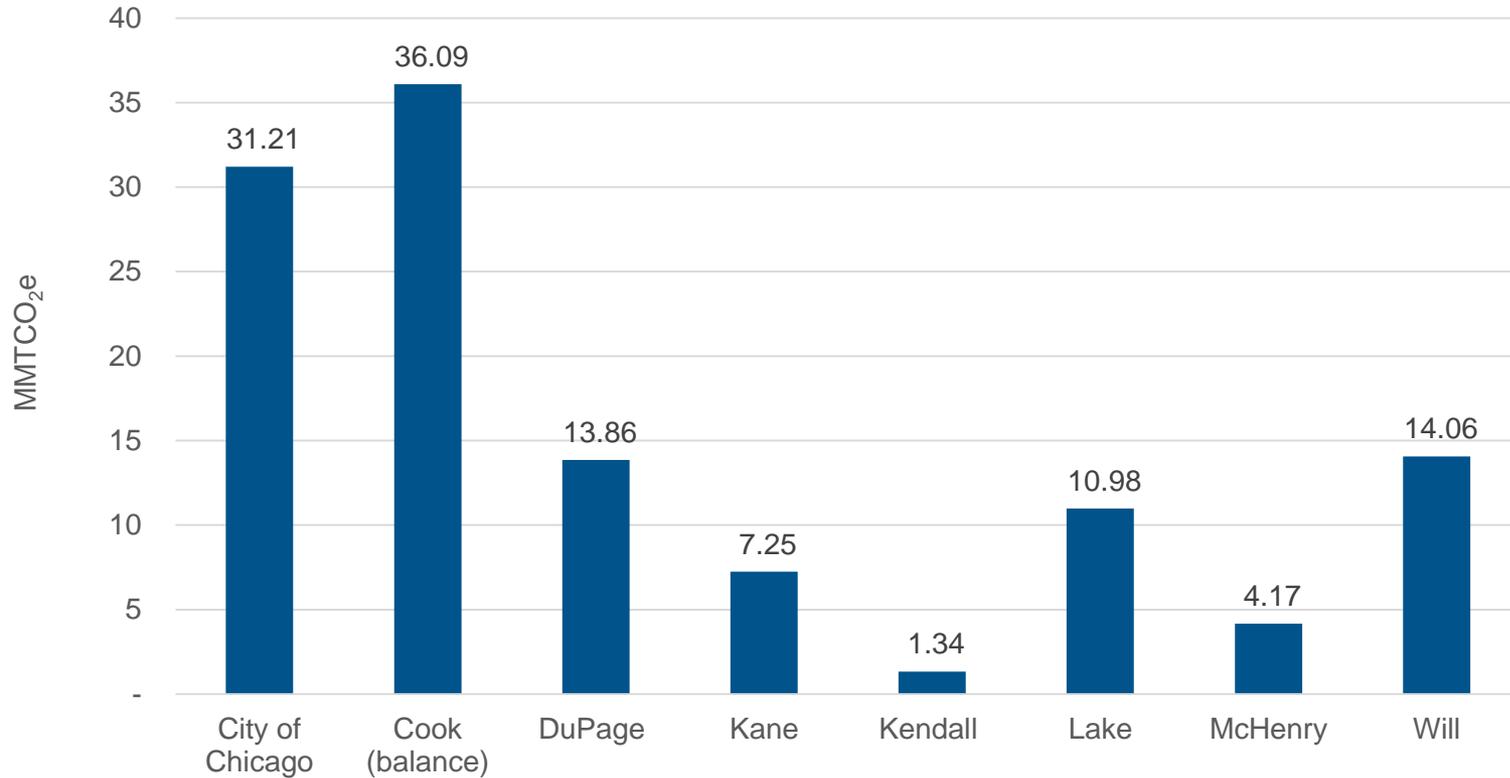
2015 Regional Emissions by Sector



- In 2015, the Chicago Region emitted an estimated total of roughly **119 MMTCO₂e**

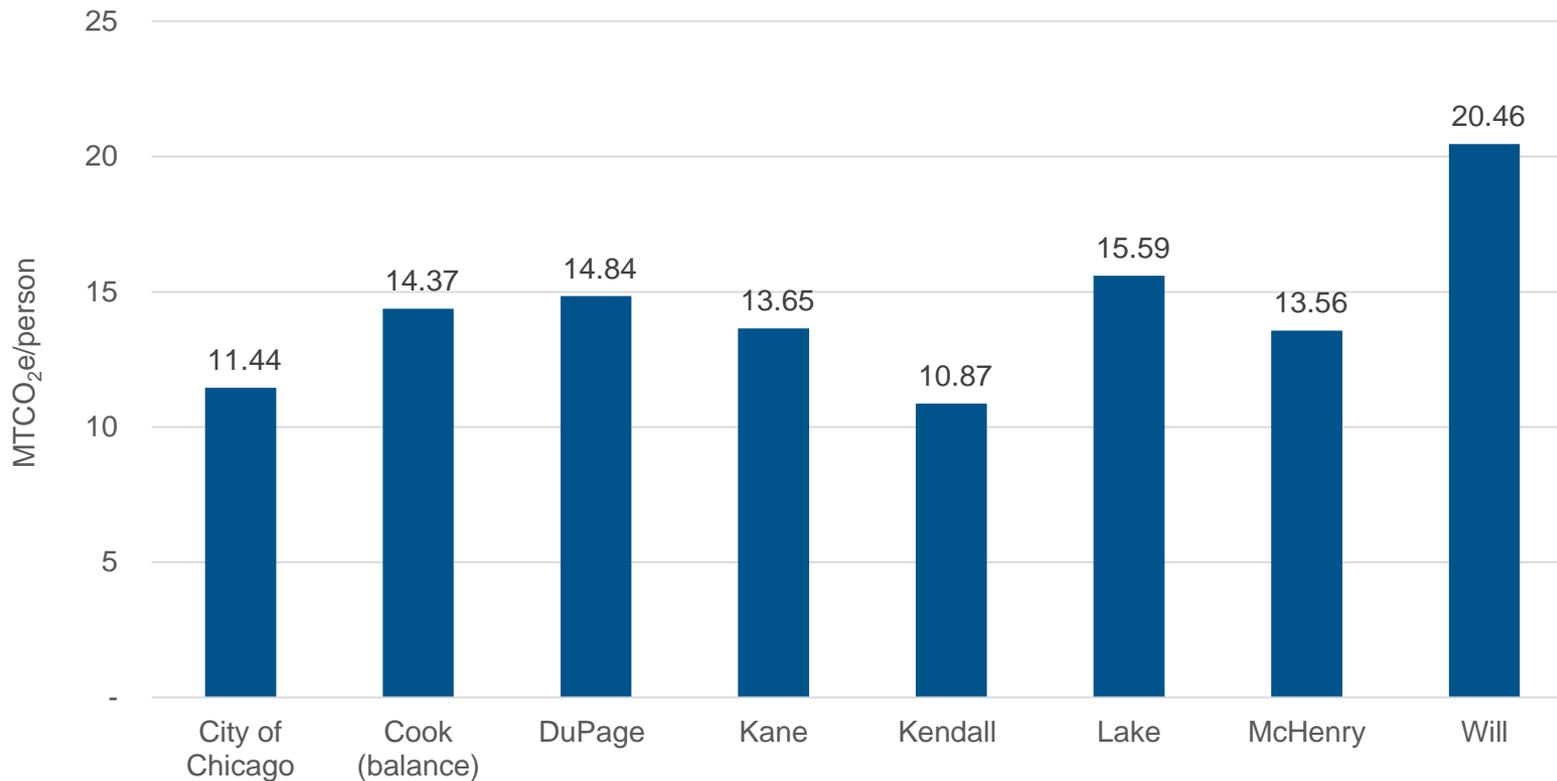
Draft Inventory Results

2015 Regional Emissions by County



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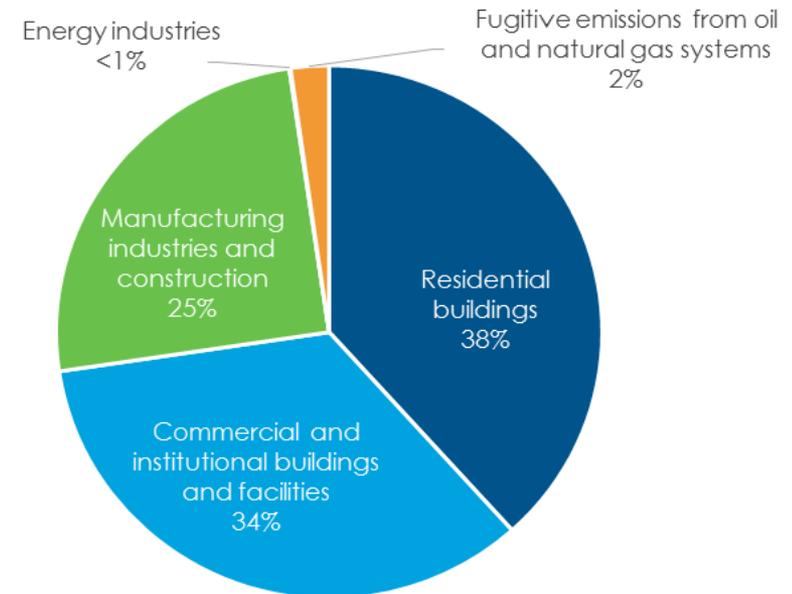
2015 Regional Per Capita Emissions by County



Stationary Energy Emissions

- **Residential Buildings** - 48% from electricity use, 52% from natural gas consumption
- **Commercial and Institutional Buildings and Facilities** - 68% from electricity use, 32% from natural gas consumption, <1% from other fuels
- **Manufacturing Industries and Construction** - 76% from electricity use, 24% from natural gas consumption, <1% from other fuels

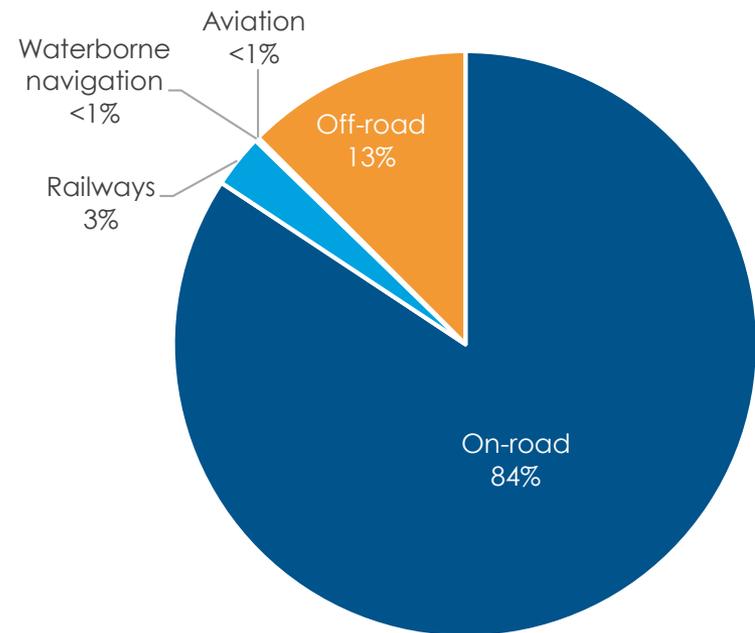
2015 Stationary Energy Emissions



Transportation Emissions

- **On-Road** – 45% from passenger cars, 31% from light-duty trucks, 23% from medium- and heavy-duty trucks, 1% from motorcycles and buses
- **Railway** – 77% from passenger trains and 23% from freight
- **Off-Road** - 46% from construction and mining, 34% from industrial and commercial, 18% from lawn and garden, and 2% from logging, railroad, and recreational

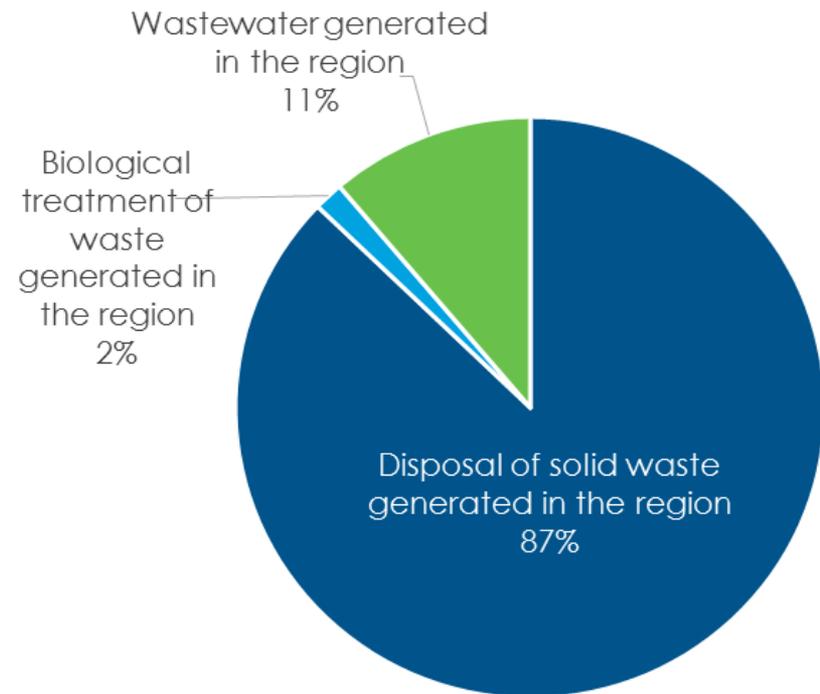
2015 Transportation Emissions



Waste Emissions

- **Solid Waste** – 7 million metric tons of solid waste generated
- **Biological Treatment** – 270,000 metric tons of waste treated
- **Wastewater** – 580,000 gallons of water generated

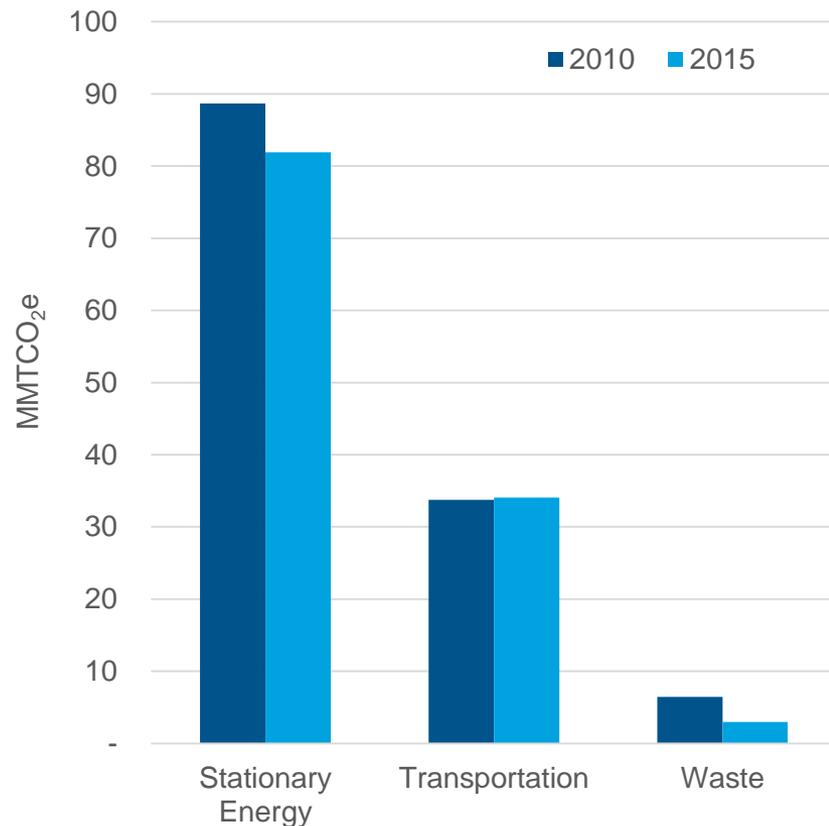
2015 Waste Emissions



2010-2015 Emission Trends

- Emissions decreased by 8% from 2010 to 2015 (from 129 MMTCO₂e to 119 MMTCO₂e)
- **Stationary Energy** emissions decreased largely due to a decrease in electricity use
- **Transportation** sector emissions increased slightly due largely to an increase in off-road fuel consumption
- **Waste** emissions decreased largely due to an increase in methane recovery at landfills

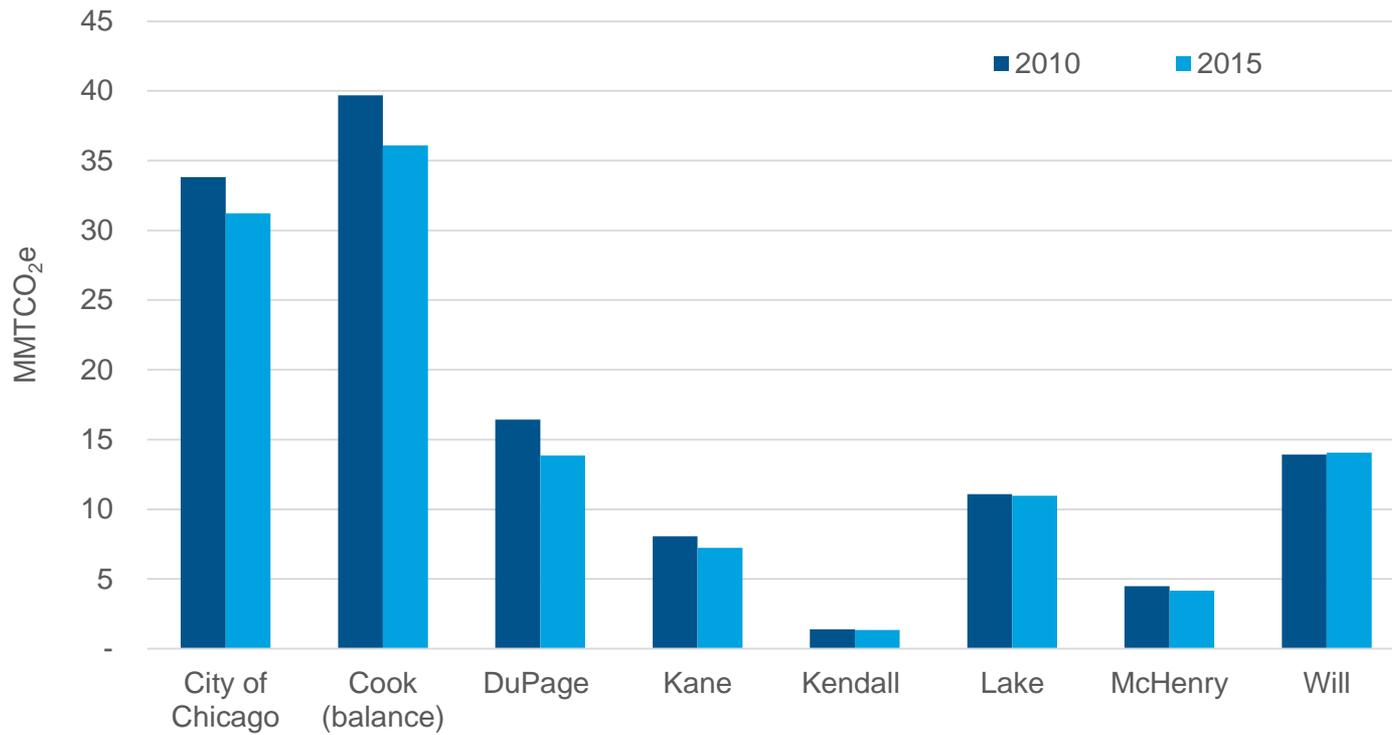
Regional Emissions by Sector
(2010 and 2015)



2010-2015 Emission Trends

- Emissions decreased for the City and all counties, except Will County (due largely to an increase in electricity and natural gas consumption)

Regional Emissions by County (2010 and 2015)



2010-2015 Emission Trends

Parameter	2010	2015	% Change
Stationary Energy			
Total Building Electricity Usage (billion kWh)	83.81	78.64	-6%
Per-Capita Total Building Electricity Usage (kWh/person)	9,940	9,225	-7%
Total Natural Gas Usage (billion therms)	5.40	5.71	6%
Per-Capita Total Natural Gas Usage (therms/person)	641	670	5%
Transportation			
Total On-Road VMT (billion miles)	54.88	56.13	2%
AFV VMT (million miles)	3.00	115.06	3740%
On-Road Per Capita VMT (miles/person)	6,509	6,585	1%
On-Road Emissions Intensity (MT CO ₂ /thousand miles)	0.52	0.51	-2%
Waste			
MSW Landfilled (million metric tons)	8.36	7.18	-14%
Average Weighted Methane Capture	64%	81%	26%
Amount of Waste Composted (metric tons)	239,366	273,290	14%
Wastewater Volume (million gallons)	591,788	576,646	-3%
Comparators			
Population	8,431,386	8,524,670	1%
Households	3,088,156	3,179,661	3%
Employment	3,687,398	4,085,553	11%
Cooling Degree Days	1,181	806	-32%
Heating Degree Days	5,991	6,091	2%
Regional GDP	586,930	631,669	8%

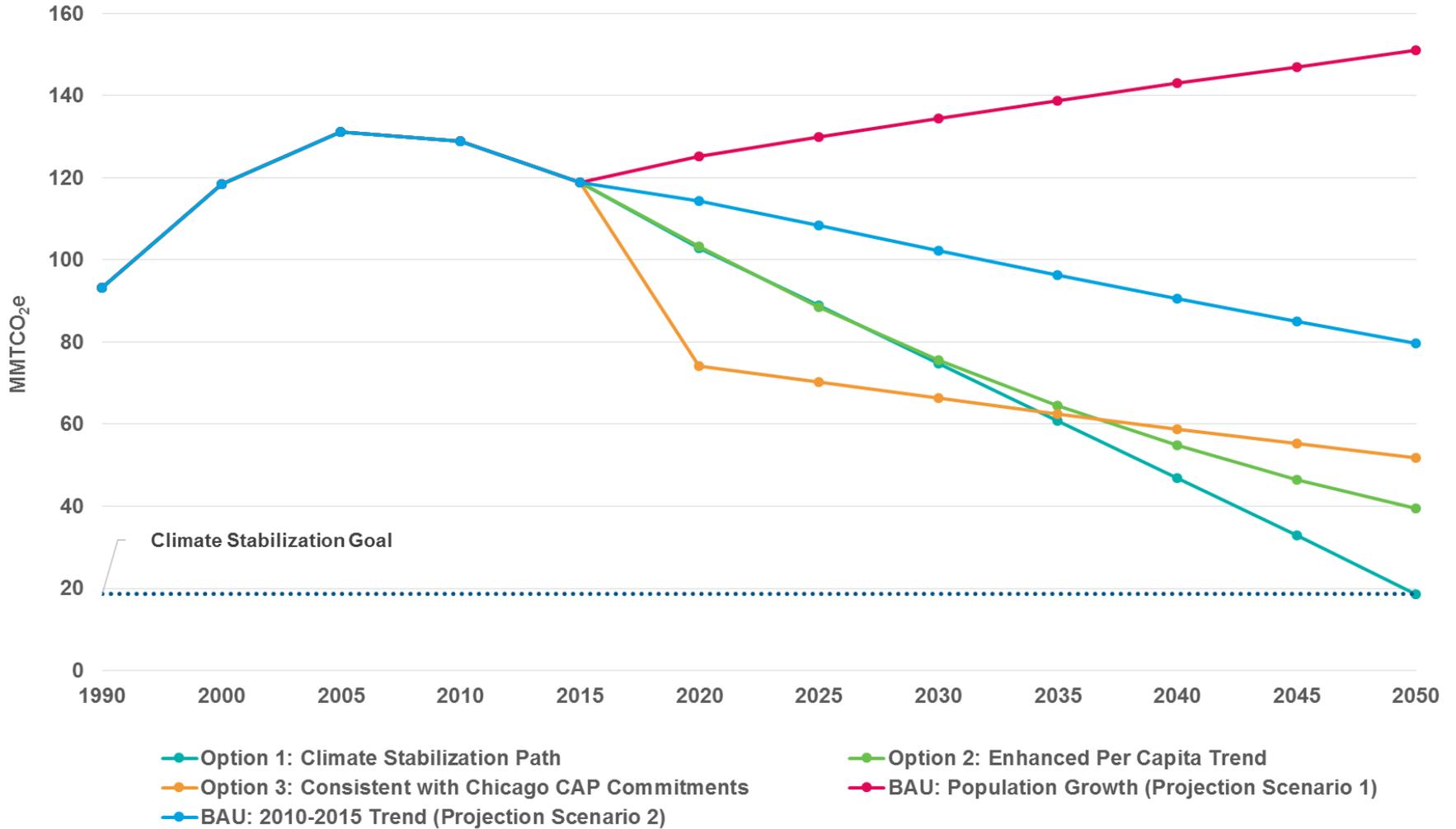
Emission Projections

- **Scenario 1:** Assumes no change in GHG efficiency per capita from 2015 in all future years (i.e., emissions increase at the rate of population growth in the region)
- **Scenario 2:** Assumes in the future GHG efficiency per capita improves at the same rate as that between 2010 and 2015 (i.e., every 5 years per capita emissions will decrease by roughly 8%)
- **Scenario 3:** Assumes that the 8% decrease in per capita emissions that were realized from 2010-2015 will double (i.e., every 5 years per capita emissions will decrease by roughly 16%)

Potential Targets

- **Option 1 – Climate Stabilization Path: Reduce GHG emissions to 80% below 1990 levels by 2050, or 86% below 2005 levels**
 - Aligns with the scientific consensus of the level of emissions necessary to stabilize the climate with a global temperature increase of no more than 2 degrees Centigrade.
 - Consistent with the City of Chicago target
- **Option 2 – Enhanced Per Capita GHG Reductions: Reduce per capita emissions by 16% every 5 years out to 2050**
 - Based on an enhancement of the trend realized from 2010-2015
 - Consistent with emission projection Scenario 3
- **Option 3 – Chicago Climate Action Plan Achievable Reductions: Achieve a 35% reduction from BAU emissions by 2020**
 - Utilizes the percentage of reduction expected by the City of Chicago through the implementation of the City’s 2010 Climate Action Plan
 - BAU emissions based on emission projection Scenario 2

Emission Projections and Potential Targets



Questions and Answers

